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Bakalářská práce

bakalářský studijní obor **Angličtina v elektrotechnice a informatice**

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Anotace

Bakalářská práce popisující překlad první kapitoly elektrotechnické učebnice za účelem zlepšení integrace zahraničních studentů. Obsažená témata zahrnují překladové teorie a jejich demonstrace na přeloženém textu a zkušenosti získané tímto procesem.

Abstrakt

Tato práce popisuje proces překladu první kapitoly elektrotechnické učebnice z ČVUT. Tento překlad bude použit budoucími studenty ERASMU, kteří přijedou do Prahy studovat elektrotechniku. Tato práce se skládá ze seznamu vysvětlených překladových teorií, samotného přeloženého textu, demonstrací teorií na přeloženém textu a závěru s osobními zkušenostmi získanými tvořením této práce.

Klíčová slova

Překlad odborné informace, pragmatické aspekty, odborné termíny, odborný styl

Annotation

Bachelor’s thesis concerned with the translation of electro-engineering textbook. Purpose of this thesis is to improve integration of foreign students. This thesis covers translation theories and their demonstrations on the translated text and experience acquired during this process.

Abstract

This thesis is concerned with the full description of the process of translation of the first chapter of ČVUT electro-engineering textbook. This text will be used by future ERASMUS students coming to Prague to study electro-engineering. This thesis consists of an explained list of translation theories, the translated text itself, demonstration of mentioned theories and conclusion with personal experience.

Keywords

Translation of scientific information, pragmatic aspects, scientific terms, scientific style

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V Brně dne ....

(podpis autora)

Poděkování

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Table of Contents

1.Introduction

This bachelor’s thesis is concerned with translation of Czech electro-engineering textbook about distribution systems. My thesis covers the first chapter of the mentioned textbook. This chapter deals with two functional styles, administrative and professional, this fact is accounted for in the translation and explains possible differences in the style of writing. The translated text will be used by foreign students that come to Prague to study electro-engineering in Czech culture setting. I have chosen this thesis to interact with ČVUT study materials and contribute towards better integration of ERASMUS students into Czech education system as well as to experience the process of translation of a complex text. The thesis is divided into five main chapters, including this one, each covering a significant part of the translation process. The second of them being the translation theories, where the reader is introduced to the necessary knowledge needed to comprehend the upcoming translated text in Chapter 3. Each operation mentioned in the theory is then demonstrated on the translated text in Chapter 4, together with the supplementation of pragmatic aspects of the text, concluding with Chapter 5. This thesis should therefore introduce the reader into the whole process of translating any text under administrative or professional functional styles.

2.Translation theories

This chapter is concerned with classification of translation procedures, types, stages, and problems encountered during translation. Many ways of translation classification, viewpoints and other theories are omitted from this chapter due to either their absence in functional styles occurring in the translated text or due to the low ratio of comprehensiveness to relevance for commenting on this translated text. These aspects are further mentioned later in Chapter 4 on concrete example.

2.1. Translation procedures [3]

There are two main ways of dividing the procedures of translation. Unequal levels of difficulty are compensated by broadening the scope of operations the theory accounts for.

2.1.1. Translation procedures described by Vinay and Darbelnet [9]

The chronologically first classification was written by Vinay and Darbelnet in 1958. They classified the procedures into 8 classes:

1) **Transcription**- also called transliteration, technique that converts a word in a predictable manner, letter by letter, to the target language.
2) **Calque**- using a specific suitable lexical equivalent.
3) **Substitution**- procedure in which the translator changes the word-class of the translated word to find a more accurate or more suitable equivalent in target language.
4) **Transposition**- used for changing the word-formation of a sentence.
5) **Modulation**- used for description of words heavily influenced by the cultural setting or other factors which make the lexical equivalent inaccurate.
6) **Equivalence**- an option to use different stylistic means for description after translation.
7) **Adaptation**- a procedure where a word or phrase is translated accurately yet shows no similarity when comparing the translation with a word-to-word translation.
8) **Borrowing**- procedure of keeping the lexical element in the original language [4]

2.1.2. Translation procedures classification by Joseph L. Malone [7]

The approach of Vinay and Darbelnet is further supplemented by Joseph L. Malone. This classification was published in 1988 and divides the procedures to 9 classes:

1) **Equality-** case of using a perfect lexical equivalent.
2) **Substitution-** performed when there is no equivalent available, resulting in need of replacing the lexical element for one with maximal semantic similarity.
3) **Divergence-** case of having more than one lexical equivalent in the target language.
4) **Convergence-** case of having more than one possible equivalent in the source language.
5) **Amplification-** procedure of using a lexical equivalent and further description during translation to improve the accuracy of the translation.
6) **Reduction-** procedure of omitting description of a lexical element in translation for improvement of the readability of the translation or elimination of possible redundancy
7) **Diffusion-** process of using more words in translation due to non-existence of a suitable lexical equivalent.
8) **Condensation-** process of using less words during translation in case of existence of a suitable title or description in the target language.
9) **Reordering-** process of rearranging the word-formation of a sentence or phrase. This process is needed when the usage of the word-formation of the original language would be considered faulty in the grammatical rules of the target language.

2.2. Principles of translation [1]

Jakobson divided translation to 3 basic principles based on their purpose.

2.2.1 Intralingual translation

This principle of translation occurs when the original and target language are the same. This fact signifies changes in other properties, e.g., adjustments in stylistics, readability, or difficulty.

2.2.2. Inter-semiotic translation

This principle of translation changes a semiotic system of original text into a different system or vice-versa. Examples of semiotic systems account formulae, figures, language, or equations.

2.2.3. Interlingual translation

This type of translation changes the language of a text from the source language system to a target language system chosen by the translator.

2.3. Types of interlingual translation [1]

The most common differentiation between 2 types of translation was invented by Peter Newmark [8].

The main difference between these types of translations is that the communicative translation uses more general expressions and therefore has the tendency to under-translate, meaning some details may be omitted.

With the omission of not changing the original text, the most extreme case of under-translation is a literal, also called word-for-word translation. This is a process of translating every single word by a lexical equivalent carelessly for its semantic meaning in a sentence or phrase.

Outlier in this category is a stylistic translation, which prioritizes stylistic features of the text above any other viewpoint, even semantic and grammatical. Majority of stylistic translation occurs in artistic texts with rhythmic and rhymical properties like poems and lyrics.

Whereas the semantic type, frequently using amplification and diffusion translation procedures, has the tendency to over-translate, leading to redundancy and reduction of readability of the text. Over-translation is frequently spotted by unnecessarily prolonged sentences.

2.3. Stages of translation [6]

According to J. Levý, any translation process consists of exactly three stages.

The “decoding” or comprehending stage, where the translator reads the text in the original language and attempts to comprehend not only the meaning of the text but also the intentions of the author.

The second stage is called “coding” or interpretation in which one begins to analyse the text and maintains his own interpretation does not overshadow the authors.

The final stage is named “reproduction” or re-stylization. Here the translator finds a lexical equivalent for each word, whilst keeping the semantic meaning unchanged.

2.4. Problems in the process of translation

This subchapter covers the main categories and subcategories of mistakes occurring during translation with the omission of simply misunderstanding the original text or ignorance of the grammatical rules of the target language. Problems in the process of translation are categorized as quantitative or qualitative. The difference between these categories lies in the possibility of correct understanding of the given mistake. Quantitative mistakes contain this possibility, while qualitative mistakes do not. This difference is also utilized in the scoring models of language tests in the education system.

2.4.1. Quantitative mistakes

Every translation faces the problem of accuracy, since usage of word-for-word translation proves to be, at times, semantically incorrect. This signifies the need of letting imagination do the work and think of a more suitable lexical equivalent, resulting in semantic translation. One then should be more concerned about not over-translating.

2.4.2. Qualitative mistakes, interference

Interference describes usage of grammatical rules of original language and/or native language of the translator in the target language.

The first type of qualitative mistake is called False Friends. This type of mistake covers the area of stylistic similarity of lexical elements which have a considerable semantic difference. These similarities are more frequent in languages which share their origin.

The next type of qualitative interference is called word-formation. This mistake occurs when the translator follows the rules of word-formation of the original language in the target language.

The third type of mistake that is classified as a quality-based interference is called Phraseologism, which occurs in incorrect translation of idioms due to violation of adaptation translation procedure.

The last category of qualitative mistake covers the area of prepositional and connotational bonds.

3.Translated text

List of abbreviations

Abbreviation	**Meaning**
ASDŘ	Automatized system of dispatcher management
ČEPS	ČEPS, a.s. –operator of transmission system of ČR
ČR	Czech Republic
DS	Distribution system
DT	Distribution transformer
DTS	Distribution transformer station
ERÚ	Office of power resource regulation
ES	Electrical grid
HDO	Load management
MPO	Department of industry and trade of Czech Republic
PDS	Operator of distribution system
PLDS	Operator of local distribution system
PPDS	Rules of operation of distribution system
PPPS	Rules of operation of transmission system
PPS	Operator of transmission system
PS	Transmission system
ŘPÚ	Council of maintenance
ZS	Ground fault
nn	Low voltage - 50-1000V
vn	high voltage - 1-52kV
vvn	very high voltage - 52-300kV
U	V (voltage)

All other symbols and abbreviations are explained imminently after their appearance.

1. Introduction

The knowledge of operating distribution systems belongs to the graduation prerequisites of university of power engineering. The publication will introduce the reader with the basic characteristics of networks, individual voltages, and most frequent malfunctions one could encounter. The next part of the publication revolves around singular elements of networks e.g., transmission lines, transformers, and grounding systems. After said chapters the reader will be introduced to the matters of over-voltages, overvoltage precautions, operation of distribution networks and work on apparatuses in distribution networks.

Management of distribution networks is provided by the operator, which is bound to rules endorsed by the ERÚ and other validated legislation.

1.1. Prerequisites (Basic terms)

This chapter refers to [1] and the goal of this section is unification of terms with validated legislation.

Load diagram- diagram of a specific type of required power (e.g., real, reactive…) per a unit of time (e.g., day, week…).

Electrical substation- complex of buildings and devices of electrical grid which enables transformation, compensation, transmission, and distribution of electric energy. This includes the means of ensuring relay of such energy.

Electrical grid (ES)- interconnected complex of devices that create, transmit, transform, and distribute electric energy, including electrical sockets, transmission lines, measuring systems, protection systems, control systems, security systems, information systems and telecommunication technology. The default layout of the ES can be found in the attachment 1.1[4].

Energy law (EZ)- law No. 458/2000 Sb. 28.11.2000 of the conditions of business and prosecution from the government in matters of the energy industry and changes in several laws in earlier regulations.

Load management (HDO)- set of devices with the use of controlling electronic devices, measurement, and prospectively other services towards the transmission of control signals at reduced frequency through DS networks.

PS, DS dispatcher management- section which regulates traffic PS, DS through a technical dispatcher of the operator PS, DS defined in decree [5].

Distribution system (DS)- interconnected set of 110kV lines and devices from the transmission system (with specific exceptions), 0,4/0,23 kV, 1,5 kV, 3 kV, 6 kV, 10 kV, 22 kV, 25 kV, 35 kV lines and devices used for distribution of electricity for a designated area in ČR (fig. 1.2), including measuring systems, protection systems, control systems, security systems, information systems and telecommunication technology. DS are established and operated in public interest. The functions of DS are frugal and safe supply of electricity in exact amount and quality in given time, Provision of distribution services both inside and outside of the system, and support services on DS level.

Normal state- status in which the operational values are in allowed boundaries, criterion N-1 is fulfilled for 110kV lines and the busbars of 110kV/vn stations which supply DS, and there is no malfunction, revision, or maintenance reason to restrict the delivery of electricity to the consumer or the producer.

Regulations for scheduling and connecting DS- rules for the provision of information regarding standards of delivery of electricity of DS, development policy and conditions for connection to the user. Power plant connection conditions are to be separate. This set of regulations permits the user to acquire the overview of distribution capabilities, production capabilities, network load, and further information about DS.

DS development policy- synopsis of proceedings ensuring the optimal development of DS both technologically and economically linked to all present and future consumers.

Prosecution rules of distribution system (PPDS)- file of publicly available documents, approved by ERÚ. These documents cover the policies of activities of DS operators and consumers.

PPDS define technical aspects of the relationship between the PDS and every consumer of DS. Observance of statutes of PPDS is obligatory to all consumers of DS and PDS. PDS are obliged to not only PPDS but also licensing liabilities, and general legal regulations, and PPPS.

Rights and duties of PPS are not specified in detail in PPDS due to their specification in PPPS. Interface requirements between PS and DS are specified in PPPS as well.

PPPS and PPDS are essential for:

- The overall effectiveness of ES operations

- Adequate achievable extent of consumer’s energy supply security and quality
- Transparent and indiscriminatory policies regarding access of all consumers to the system

PPDS do not include all regulations that are consumers of DS obliged to. Further compulsory regulations are described in separate individual legal regulations, technical norms, security regulations, fire protection standards, environment protection standards and regulations for supply of electricity.

PPDS are composed of two key parts:

- DS scheduling and connection regulations
- DS operational regulations

PPDS are legally binding to:

- PDS
- PPS
- PLDS
- Power plants connected to DS
- Electricity traders
- customer

All users are obliged to acquire knowledge of parts of PPDS, which cover their category of usage of DS. These categories vary by types of connection to the DS and the type of relation between the DS and the user.

PPPS define the technical aspect of operational relations between PS and all users connected to the PS. Certain regulations cover the operations of power plants connected to DS.

Operational regulations for DS regard the matters of user cooperation regarding the assessment of assumed demand, scheduling DS function shut-downs, obligation of providing reports regarding alterations of operation, and relevant incidents regarding safety of DS devices and the necessary procedures leading to dealing with such events in the safest manner.

Requirements for provision of personal data from the user to the PDS can be found in the regulations for filing personal data to the system. This data is required as it improves the accuracy of scheduling operations and development of DS significantly. Due to the confidentiality of this data, it is possible to provide under specific conditions defined in the universal usage requirements of DS in PPDS.

PDS must ensure indiscriminatory policies towards all authorised users of DS.

List of categories of usage of DS:

a) Electricity supply to DS (through input connections) from:
   - PS
   - Power-plants connected to DS
   - Other DS
   - Other nation
b) Electricity supply from DS to PS
c) Consumption of DS electricity (through output connections) to
   - Consumer devices
   - Other DS
   - Other nation
d) Internal relocation of electricity inside of DS
e) Provision of services (e.g., power or voltage regulation), emergency electricity supply and temporary coverage of supply in case of insufficiency or blackout of original source.

Specific categories of DS usage require multiple variations of contracts which are further customized based on technical conditions. These contract variations cannot violate PPDS. Should any DS contract condition include usage of PS, the user must fulfil this condition and is obliged to follow PPPS as well.

DS operator (PDS)- physical or legal entity, owner of electricity distribution license. Local PDS may operate on locations exempt from the area designated by contract. PDS is held responsible for security and reliability of DS, whilst obliging the environment protection regulations and DS development regulations. These liabilities are to be fulfilled by assigned employees or himself.

Mandatory action required of PDS is enablement of energy distribution throughout the designated area and individual connections of legitimate users. Methodology of these actions is predetermined by balancing load distribution and abiding the limits of individual elements of the network.

Transmission system (PS)- interconnected set of 400kV, 220kV and selected 110kV lines and devices used for transmission of electricity throughout ČR and maintaining connection to neighbouring PS, including measuring systems, protection systems, control systems, security systems, information systems and telecommunication technology. DS are established and operated in public interest.

DS operation preparation- conducted together with DS operation preparation. This process regulates precautions taken in areas of generation, distribution, and consummation of electricity. The objective of this process is achievement of reliable, and safe operation of DS and preservation of integrity of all relations of users including PDS.

Plan of regulation restricts the power delivered to the user, calculated by MPO regulations.

DS traffic management solves unpredictable events occurring in DS and PS. These actions must be implemented directly and attempt to prevent the possibility of future accidents.

Production management adjusts and regulates power plant operators to achieve specific values of effective and reactive power.

Consumption management adjusts and regulates the values of power which is already in the system.

Secondary regulation U/Q maintains the requested values of voltage in key local nodes and distributes reactive power to individual pathways.

Reliability of operation represents the ES ability to provide supply of electricity whilst maintaining all security parameters, specifically the frequency, power, and voltage in safe ranges.

Emergency state limits or suspends supply of electricity throughout ČR or specific areas depending on multiple possible events. These events are listed and described in detail in EZ.

System services ensure the reliability of operations of ES ČR. These actions are provided by PS and DS.

Pause plan specifies the procedure which ensures the briefest delay between cutting and restoring supply of electricity.

DS blackout represents a state in which the entirety or majority of DS lacks the ability to supply power.

1.2. Electrical grid

This system consists of sources, network, and consumption (fig. 1.1). The core of ES is formed by PS. Key components of PS are [4]:

- 400kV, 220kV and selected 110kV network
- Utilization of power from transmission (high-power) power plants
- 110kV transformers
- Connection to the systems of neighbouring countries through border transmission lines.

DS is strictly connected to PS. Key components of DS are:

- Voltage levels from 110kV to 230V
- Star or ring network topology
- Supplying large-scale consumers with high voltage levels, and regular consumers with 400/230V
- Utilization of distribution (low power) power plants

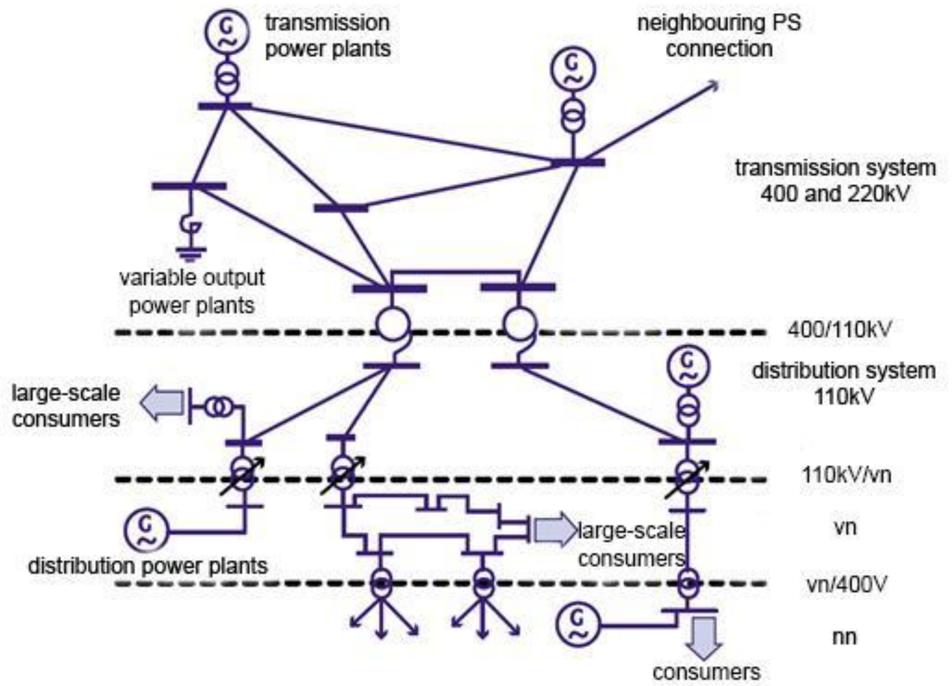

Fig. 1.1: ES layout

1.3. Layout of distribution system

1.3.1 Fundamental ES network layouts

- Open circuit with one possible supply path (star and bus topology)
- Closed circuit with multiple possible supply paths (ring and mesh topology)

Selection of network topology alters power distribution, cost of operations and security of the system. All topologies are illustrated (fig. 1.3).

400 and 220kV Transmission system utilizes ring topology connecting domestic high-power power plants.

Fig. 1.2: Division of DS in ČR [3]

110kV distribution system networks ensure electricity supply from zvn/vvn or vvn/vvn transformer stations to 110kV/vn transformer stations. This ring topology transfers energy from multiple power plants. Power of these power plants reaches decades of megawatts. This system is further distinguished by high reliability. There is a lower probability of supply interruption if a singular accident occurs. This feature is achieved by redundancy. Number of transmission lines on singular pole ranger from one to four.

Owner	Overhead line [km]	Underground line [km]	Total [km]
PPS	45	0	45
PDS	12 245	13	12 258
Other	439	119	558
Total	12 279	132	12 861

Tab. 1.1: Sum of vvn transmission line length in ČR to date 31.12.2010 [2]

Vn distribution system networks are formed by overhead and underground transmission lines. Majority of vn lines operate on 22kV or 35kV. 3, 6, and 10kV lines still operate, but are considered obsolete and will be replaced to unify the voltage levels of the networks. Majority of these networks have star or bus topology. Urban areas allow for further connection to hybrid and ring networks.

Owner	Overhead line [km]	Underground line [km]	Total [km]
PDS	58 734	12 979	71 713
Other	1 154	6 536	7 690
Total	59 888	19 515	79 403

Tab. 1.2: Sum of vn transmission line length in ČR to date 31.12.2010 [2]

Nn distribution system networks are formed by star and bus topologies. Dense urban areas allow for adjustment into mesh topology.

Owner	Overhead line [km]	Underground line [km]	Total [km]
PDS	65 764	71 706	137 470
Other	774	23 142	23 916
Total	66 538	94 848	161 386

Tab. 1.3: Sum of nn transmission line length in ČR to date 31.12.2010 [2]

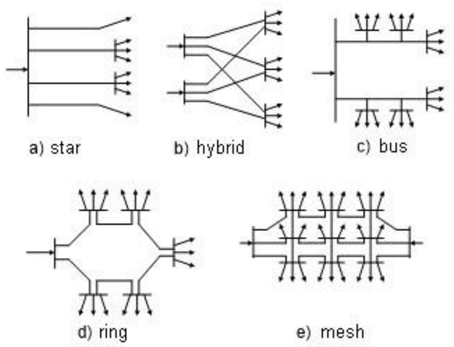

Fig. 1.3: Network topologies

1.3.2 Connection of non-identical voltage levels transformer winding

Specifications of transformer winding to ground connection are essential.

Connection of one phase to the ground alters the values of:

- Fault current
- Voltage between phase conductor and ground

Value of the current determines the appropriate manner of adjusting and protecting the system. Value of the mentioned voltage requires an adequate level of insulation. Normal state of operation does not contain any ground current. Voltage between phases is called phase voltage. Voltage between a phase and load is called line voltage. These statements differ when one or multiple phases are connected to ground. Networks can be divided into three types based on the manner of single-phase grounding.

- Effectively grounded
- Ineffectively grounded
- insulated

Rated voltage, layout, and transformer node connection are the essential parameters for defining the attributes and usage possibilities of a network. The table below specifies the usage of listed types of networks in ČR.

	Voltage level	Rated voltage	Network topology	Transformer node connection
PS	vvn	400 kV	Ring	Effectively grounded
		220 kV		
DS		110 kV	Ring, star	
	vn	22 kV, 35 kV	Bus, star, hybrid, (possibility of ring)	Ineffectively grounded, compensated
		10 kV		
		6 kV		Ineffectively grounded or insulated
	nn	500 V	Bus, star, mesh	Insulated
		400/230 V		Effectively grounded with central output conductor

Tab. 1.4: Network usage based on voltage levels

1.3.3 Development of transformer systems PS/110 kV

This chapter supplements [5] and deals with the connection between PS and DS. This connection is formed by 400/220/110kV transformers. Quantity and power of these transformers significantly affects the reliability and security of electricity supply.

1.3.3.1 Determination of quantity and load limits of PS/110kV transformers in transformer stations

Quantity and capacity of transformers in transformer stations is predetermined by factors such as node load, development policies, possible emergency power increase, input power or load of output 110kV network. These factors are evaluated and updated in regular intervals for optimization of assessment of future development. These procedures are necessary for reliability required on the electric energy market [5].

Default state, units, and indicators:

- Quantity and power of transformers in station
- Mandatory reserved input power
- Transformer node load

List of factors influencing development of PS/110kV transformer stations:

Operations of 110kV networks– these networks are in most cases operated separately from DS node areas. These areas use 1-3 PS/110kV transformers for PS connection. Substitution is improbable in the near future. Parallel operations of 110kV networks with PS are used scarcely, in need of supply for a large-scale consumer. These operations endanger supply routes by increasing reactive power demand. Increasing usage of such connections would put a large amount of pressure on the network and require costly improvements.

Role of PDS in transmission ability of 110kV networks between node areas– Transmission of power between neighbouring node areas is not uniform. Node areas should be capable of replacing power of any single transformer from designated station through PS or alternative connection with neighbouring node areas in case of emergency. PPS and local PDS are responsible for determination, implementation, and maintenance of one mentioned power replacement method based on individual economic and technical factors.

Source capacity supplying 110kV networks– this factor divides node areas into 2 categories [5]:

- Consumption oriented node area – Majority of supply is transmitted through PS/110kV transformation. No other large-scale sources are present. Absence of any other source would not drastically change the power demanded from PS/110kV transformers.
- Quasi-self-sufficient node area – local sources cover a significant fraction of demand. These sources are mostly small-scale and typically one large-scale source is present. Demand outweighs the local supply but is equilibrated by PS/110kV transformation. Absence of the large-scale local source would drastically increase the power demand of PS/110kV transformers.

250 and 350 MVA devices are used in400/110kV transformation. 22/110kV transformation uses 200MVA devices. Values of power used in PS/110kV transformer stations are specified in regulations for reserved power.

Alteration of this value on PS/DS border must be in accordance with “Policies of PS/DS border capacity development” [5].

Policy compliance is achieved by addition or substitution of transformers. Determination and implementation of correct methods of power capacity increase are determined by specific economic and technical factors and agreement of all involved parties.

Development of PS nodes complies to the following regulations:

- Each PS/110kV node must not use more than 3 350MVA transformers.
- Prospective necessity of parallel transformer operation requires duplication redundancy of each essential transformer.
- In the case of demand increase, nodes currently requiring 2 350MVA transformers must acquire a third 350MVA transformer.
- Further increase of power in nodes using 3 transformers will be implemented by exchanging 250MVA transformers for their 350MVA equivalents. This alteration will be performed with demand increase or devices outdated.
- Stations with simultaneous 400/110 kV and 220/110 kV transformation abide these regulations as well (Bezděčín, Přeštice, Sokolnice, Výškov).

Increase of power in PS nodes requires further economic and technical evaluations with current device state analysis. These evaluations outline the budget, and schedule with regards to specific circumstances.

1.4. Voltage characteristics

ČSN EN 50160 defines and regulates the core voltage types for user connection to DS nn, vn, and vvn in normal state.

Conditions to exclusion from normal state

a) Temporary system changes due to accidents, maintenance, or reconstruction of the network.

b) Violation of PPDS on the side of the user

c) Unpredicted situations due to:

- Weather conditions or natural disaster
- Government restriction or illegal deed
- Industrial cause (e.g., strike)
- Force majeure
- Power insufficiency due to outside interference

Parameters of supply voltage:

- frequency
- magnitude
- wave shape
- symmetry of phase voltage

These values fluctuate due to load instability, interference, and connected devices and possible malfunctions.

1.4.1 Network frequencies

Nn and Vn networks require a mean frequency measurement in 10 second intervals in synchronous systems. Stability of these measurements depends on the margin of error:

50 Hz ± 1%,	49,5 – 50,5 Hz	99,5% of the time
50 Hz + 4%, 50 Hz - 6%,	47 – 52 Hz	100% of the time

1.4.2 Magnitude of supply voltage

Supply voltage is measured in 10-minute intervals. Measured value must not exceed V_n +10%/-15% margin of error in more than 5% of measurements in one week excluding accidents, maintenance, reconstructions, and revisions of the network.

1.4.2.1 Rapid voltage changes (flicker)

Flicker perceptibility must not exceed the value $P_{lt} < 1$ in 95% of the measurements in any weekly period. Violation of this condition would force the network to exit the normal state.

1.4.2.2 Transient voltage drops and cuts

Voltage drops and brief cuts appear unpredictably due to mostly random phenomena which can be described statistically.

- Voltage drop is a reduction of supply voltage. Following recovery of voltage levels starts in a matter of seconds at half-period.
- Voltage cut is an interruption of energy flow, and technically a 100% voltage reduction, lasting less than a minute.
- Depth of voltage reduction is defined in figure 1.4 fraction of voltage level during the drop (ΔU=<100% ∧ ΔU>0%) from the reactive power of the network (100%).

Voltage reduction with constant depth can be described by values of depth ΔV, and duration Δt.

Voltage reduction with variable depth must be described by necessary division of the shape into smaller fractions describable by the mentioned pair of values to match a more complex shape, but due to the exceeding rarity and impracticality of this method, simplification to maximal depth and overall duration was introduced.

Voltage changes with less than 10% reaction voltage measured reduction are not considered voltage drops, but deviations. Deviations are caused by load changes, either aliasing, or sudden and repeating (PNE 33 3430-2), visualized on fig. 1.4.

ΔU and Δt cannot be prevented or reduced in transmission networks. Therefore, they are outside mitigated.

Network can be further described by frequency, depth and durations of voltage drops in an interval of time. Depths of drops can differ in phases of a network.

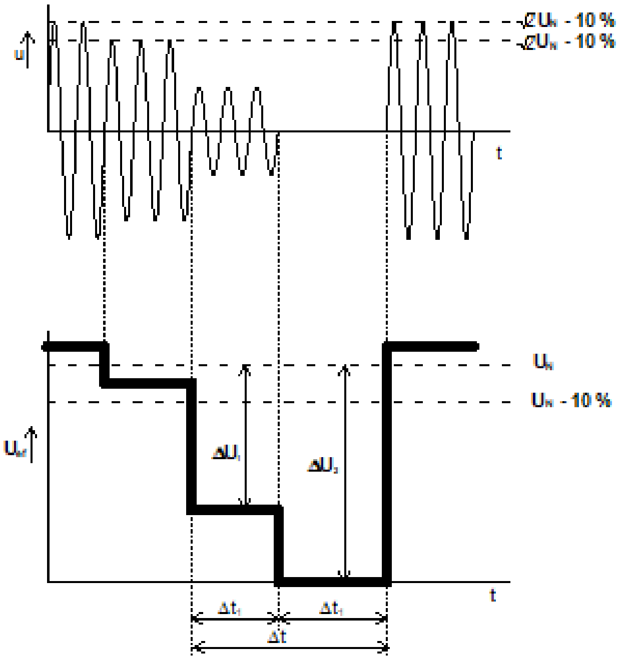

Fig. 1.4: Voltage drop and cut visualization [6]

1.4.2.3 Causes of transient voltage drops and cuts

List of possible drops and cuts causes:

- Switching operations manipulating considerable power
- Short circuiting and circuit protection. These malfunctions originate from public and user networks, or atmospheric phenomena.
- Changes of network impedance.
- Changes of short-circuit power through generators or network configuration.

1.4.2.4 Transient overvoltage

Representation of nn network overvoltage is 1,5kV (RMS) for the duration of 5 seconds or 6kV(instantaneous)

Representation of VN network overvoltage is temporary achieving 1,7 V_c in effectively or impedance grounded networks and 2 V_c in isolated systems or choke grounded transformer nodes.

Transient overvoltage is not predictable via natural overvoltage.

V_c represents standard supply voltage.

1.4.3 Harmonic voltage

Evaluation of voltage distortion is described in tables with levels of individual harmonic parts as fractions of the default value. These fractions cannot overstep their individual limits in any weekly period in >5% of the ten-minute measurements.

Furthermore, the overall factor of the harmonic source voltage distortion THD must be ≤8% according to (1.1).

$$\mathrm{THD} = \sqrt{\sum_{h=2}^{40} u_h} \tag{1.1}$$

Fundamental frequency *h*

RMS voltage of *h*th harmonic v_h

Distortion of harmonic voltage is associated with usage of transformer-based devices. These effects are not yet fully observed, and the methodology is not complete yet.

1.4.3.1 Signal voltage levels in supply voltage

PDS uses public DS for information transmission. The signal magnitude must be lower or equal to [8] in 99% of the three-second measurements throughout the day.

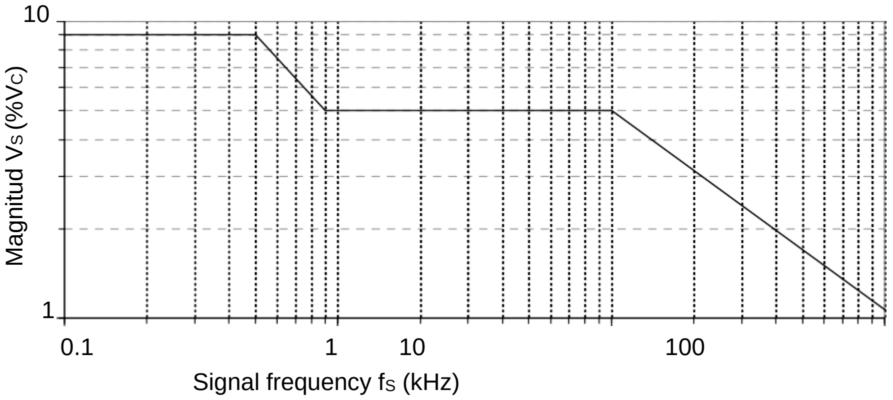

Fig. 1.5: Frequency influence on voltage levels in DS [8]

Noise signal HDO should not exceed 0,3% Vn.

1.4.4 Voltage imbalance

Normal state dictates maximum margin of error 2% in 95% of any weekly period between any neighbouring values of supply voltage. Exceptional errors up to 3% are not considered terminal.

1.4.4.1 Distribution network imbalance

Three-phase three-conductor network with asymmetric load of individual currents I_1, I_2, $I_0 = 0$ creates a phasor diagram for a positive load voltage Fig. 1.6.

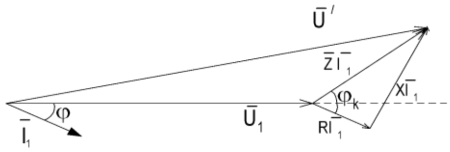

Fig. 1.6: Phasor diagram of the final load voltage

Positive and negative phase voltages correspond to:

$$\overline{U}_1 = \overline{U'} - \overline{I}_1 \overline{Z} \tag{1.2}$$

$$\overline{U}_2 = -\overline{I}_2 \overline{Z} \tag{1.3}$$

$\overline{U'}$ Source voltage

$\overline{Z} = \overline{Z}_1 = \overline{Z}_2$ impedance of the line (source and negative values are equal).

Using (1.2), (1.3) results in

$$\frac{1}{\overline{\rho}_{\mathrm{U}}} = \frac{\overline{U}_1}{\overline{U}_2} = \frac{\overline{U'} - \overline{I}_1 \overline{Z}}{-\overline{I}_2 \overline{Z}} \tag{1.4}$$

In case of $\Phi \approx \Phi_k$

$$\frac{1}{\rho_U} = \frac{U' - I_1 Z}{-I_1 Z} = \frac{I_1}{I_2}\left(1 - \frac{U'}{I_1 Z}\right) = \rho_I\left(1 - \frac{I_k}{I_1}\right) \tag{1.5}$$

$$\frac{\rho_I}{\rho_U} = 1 - \frac{I_k}{I_1}$$

$\rho_U = \dfrac{U_2}{U_1}$ Voltage imbalance ratio

$\rho_I = \dfrac{I_2}{I_1}$ Current (load) imbalance ratio

$I_k = \dfrac{U'}{Z}$ Short circuit current

Equation (1.4) obtains a negative value. Therefore, the imbalance is equidistant to 0. Acquiring load imbalance ratio allows for acquisition of voltage imbalance ratio.

$$\frac{\rho_I}{\rho_U} = 1 - \frac{S_k}{\sqrt{3}U}\frac{1}{I_1} \tag{1.6}$$

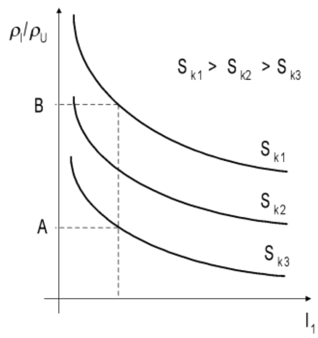

Fig. 1.7: Imbalance

Voltage imbalance is inversely proportional to short-circuit power of the network (Fig. 1.7).

1.4.4.2 One-phase power voltage imbalance dependence

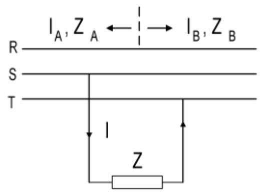

Fig. 1.8

Equation (1.7) corresponds to (Fig.1.8) [10]

$$\rho_U = \frac{Z_2^{AB}}{Z_2^{AB} + Z} \tag{1.7}$$

where $Z_2^{AB} = \frac{Z_2^A Z_2^B}{Z_2^A + Z_2^B}$ is equivalent reverse impedance AB

Z = impedance of appliance with power S_1.

If $Z_2^{AB} = Z_1^{AB} = \frac{U^2}{S_k}$ and $Z = \frac{U^2}{S_1}$, then

$$\rho_U = \frac{\frac{U^2}{S_k}}{\frac{U^2}{S_k} + \frac{U^2}{S_1}} = \frac{S_k S_1}{S_k (S_k + S_1)} \tag{1.8}$$

$$\rho_U = \frac{S_1}{S_1 + S_k} \tag{1.9}$$

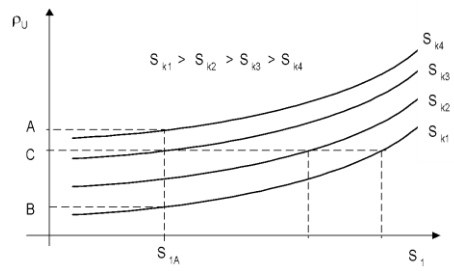

Fig. 1.9

Power of the S_{1A} appliance causes increase of voltage imbalance with decrease of short-circuit power, and vice-versa. Values A and B on fig. 1.9 acts as proof to this statement. For the stated limit of imbalance ratio, point C requires S_k adjustments for higher values of S_1.

1.4.4.3 One-phase traction system imbalance

Supplying traction transformer stations are connected to 110kV network by interloping or „T“ connection, frequently 40 to 80km apart. One locomotive possesses power of 4 to 6MW.

One transformer supply imbalance (Fig. 1.10)

Primary winding of a transformer corresponds to (1.10) if *p* = 1.

$$\begin{bmatrix} \bar{I}_0 \\ \bar{I}_1 \\ \bar{I}_2 \end{bmatrix} = \frac{1}{3} \begin{bmatrix} 1 & 1 & 1 \\ 1 & \bar{a} & \bar{a}^2 \\ 1 & \bar{a}^2 & \bar{a} \end{bmatrix} \begin{bmatrix} \bar{I}_R \\ \bar{I}_S \\ \bar{I}_T \end{bmatrix} = \frac{1}{3} \begin{bmatrix} I - I \\ (\bar{a} - \bar{a}^2) I \\ (\bar{a}^2 - \bar{a}) I \end{bmatrix} \tag{1.10}$$

where $\bar{I}_R = 0 \qquad \bar{I}_S = I \qquad \bar{I}_T = -I$

Current imbalance $\bar{\rho}_I = \frac{\bar{I}_2}{\bar{I}_1} = -1$ Voltage imbalance $\rho_U = \frac{S_1}{S_1 + S_k}$.

Secondary current *I* equals the sum of currents of input and output of the station. These currents vary based on load demands, but the final positive and negative values remain equal. This results in 100% current imbalance. Voltage imbalance depends on short-circuit power and magnitude of S_1 (1.9).

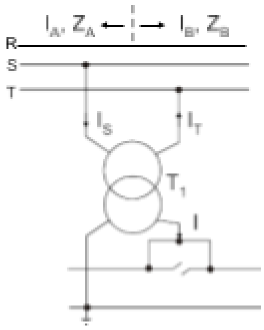

Fig. 1.10: One-phase transformer traction system supply

Two „V” Connected transformer supply imbalance (Fig. 1.11)

Voltage:

$\overline{U}_{\mathrm{RS}} = U\angle 210°$ $\qquad$ $\overline{U}_{\mathrm{ST}} = U\angle 90°$ $\qquad$ $\overline{U}_{\mathrm{TR}} = U\angle -30°$

If $I = I_A = I_B$ and transformer ratio p = 1 then current dependence (1.11)

$$\begin{aligned}
\bar{I}_{\mathrm{R}} &= -\frac{\overline{U}_{\mathrm{RS}}}{\overline{Z}_{\mathrm{R}}} = I\angle(210° - 180°) = I\angle 30° \\
\bar{I}_{\mathrm{T}} &= \frac{\overline{U}_{\mathrm{ST}}}{\overline{Z}_{\mathrm{T}}} = I\angle 90° \\
\bar{I}_{\mathrm{S}} &= -\bar{I}_{\mathrm{R}} - \bar{I}_{\mathrm{T}} = \frac{\overline{U}_{\mathrm{RS}}}{\overline{Z}_{\mathrm{R}}} - \frac{\overline{U}_{\mathrm{ST}}}{\overline{Z}_{\mathrm{T}}} = -(I\angle 30° + I\angle 90°) = \sqrt{3}.\overline{a}^2 I
\end{aligned} \tag{1.11}$$

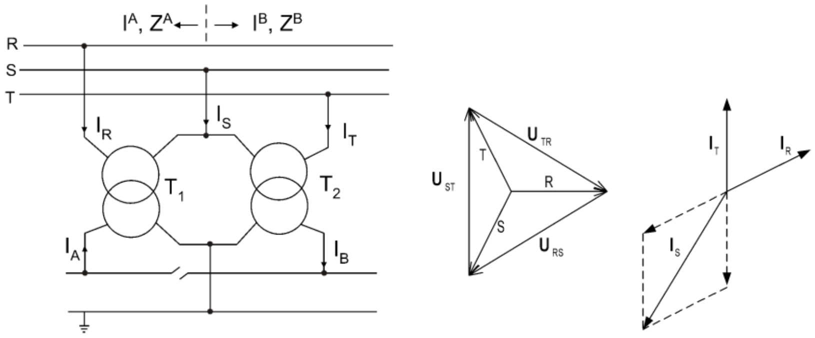

Fig. 1.11: Two „V“ connected transformer AC traction system supply

$$\begin{bmatrix} \bar{I}_0 \\ \bar{I}_1 \\ \bar{I}_2 \end{bmatrix} = \frac{1}{3} \begin{bmatrix} 1 & 1 & 1 \\ 1 & \overline{a} & \overline{a}^2 \\ 1 & \overline{a}^2 & \overline{a} \end{bmatrix} \begin{bmatrix} I\left(\dfrac{\sqrt{3}}{2} + \mathrm{j}\dfrac{1}{2}\right) \\ I.\overline{a}^2\sqrt{3} \\ \mathrm{j}I \end{bmatrix} \tag{1.12}$$

$$\begin{aligned}
\bar{I}_1 &= \frac{1}{3}\left[I\left(\frac{\sqrt{3}}{2} + \mathrm{j}\frac{1}{2}\right) + \overline{a}.I\overline{a}^2\sqrt{3} + \overline{a}^2\mathrm{j}I \right] = \frac{2}{\sqrt{3}} I \\
\bar{I}_2 &= \frac{1}{3}\left[I\left(\frac{\sqrt{3}}{2} + \mathrm{j}\frac{1}{2}\right) + \overline{a}^2.I\overline{a}^2\sqrt{3} + \overline{a}.\mathrm{j}I \right] = \frac{1}{\sqrt{3}} aI
\end{aligned} \tag{1.13}$$

$$\bar{\rho}_{\mathrm{I}} = \frac{\bar{I}_2}{\bar{I}_1} = \frac{1}{2}\angle 120° \tag{1.14}$$

Two „V" connected transformers with equal load of secondary winding result in current imbalance = 0,5.

When $I_{\mathrm{A}} \neq I_{\mathrm{B}}$

$$\begin{aligned} \bar{I}_{\mathrm{R}} &= I_{\mathrm{A}}\angle 30° \\ \bar{I}_{\mathrm{T}} &= I_{\mathrm{B}}\angle 90° \\ \bar{I}_{\mathrm{S}} &= I_{\mathrm{B}}\angle 270° - I_{\mathrm{A}}\angle 30° \end{aligned} \tag{1.15}$$

$$\begin{aligned} \bar{I}_1 &= \frac{1}{3}\left[I_{\mathrm{A}}\left(\frac{\sqrt{3}}{2} + \mathrm{j}\frac{1}{2}\right) + a.\left(-\mathrm{j}I_{\mathrm{B}} - \frac{\sqrt{3}}{2}I_{\mathrm{A}} - \mathrm{j}\frac{1}{2}I_{\mathrm{A}}\right) + a^2\mathrm{j}I_{\mathrm{B}} \right] \\ \bar{I}_1 &= \frac{1}{\sqrt{3}}\left(I_{\mathrm{A}} + I_{\mathrm{B}}\right) \\ \bar{I}_2 &= \frac{1}{3}\left[I_{\mathrm{A}}\left(\frac{\sqrt{3}}{2} + \mathrm{j}\frac{1}{2}\right) + a^2.\left(-\mathrm{j}I_{\mathrm{B}} - \frac{\sqrt{3}}{2}I_{\mathrm{A}} - \mathrm{j}\frac{1}{2}I_{\mathrm{A}}\right) + a.\mathrm{j}I_{\mathrm{B}} \right] \\ \bar{I}_2 &= -\frac{1}{\sqrt{3}}\left(a^2 I_{\mathrm{A}} + I_{\mathrm{B}}\right) \end{aligned} \tag{1.16}$$

$$\bar{\rho}_{\mathrm{I}} = \frac{\bar{I}_2}{\bar{I}_1} = -\frac{\left(a^2 I_{\mathrm{A}} + I_{\mathrm{B}}\right)}{\left(I_{\mathrm{A}} + I_{\mathrm{B}}\right)} \tag{1.17}$$

Both currents are to be considered phasors of inductive properties.

$$\bar{I}_{\mathrm{A}} = I_{\mathrm{A}}\angle -\varphi_{\mathrm{A}}\,, \quad \bar{I}_{\mathrm{B}} = I_{\mathrm{B}}\angle -\varphi_{\mathrm{B}}$$

This allows for equating

$$\begin{aligned} \bar{I}_1 &= \frac{1}{\sqrt{3}}\left(I_{\mathrm{A}}\angle -\varphi_{\mathrm{A}} + I_{\mathrm{B}}\angle -\varphi_{\mathrm{B}}\right) \\ \bar{I}_2 &= -\frac{1}{\sqrt{3}}\left(a^2 I_{\mathrm{A}}\angle -\varphi_{\mathrm{A}} + I_{\mathrm{B}}\angle -\varphi_{\mathrm{B}}\right) \end{aligned} \tag{1.18}$$

Indication of currents

$$\frac{I_{\mathrm{A}}\angle -\varphi_{\mathrm{A}}}{I_{\mathrm{B}}\angle -\varphi_{\mathrm{B}}} = \frac{I_{\mathrm{A}}}{I_{\mathrm{B}}}\left(\varphi_{\mathrm{A}} - \varphi_{\mathrm{B}}\right) = \beta\angle\Delta\varphi \tag{1.19}$$

$$\bar{\rho}_{\mathrm{I}} = \frac{\bar{I}_2}{\bar{I}_1} = -\frac{\left(1 + a\right) - \beta\angle\Delta\varphi}{1 + \beta\angle\Delta\varphi} \tag{1.20}$$

Calculation of absolute current imbalance ratio ρ_{I} allows for derivation by (β and $\Delta\phi$) and acquisition of load ratio for minimal and maximal current imbalance [10].

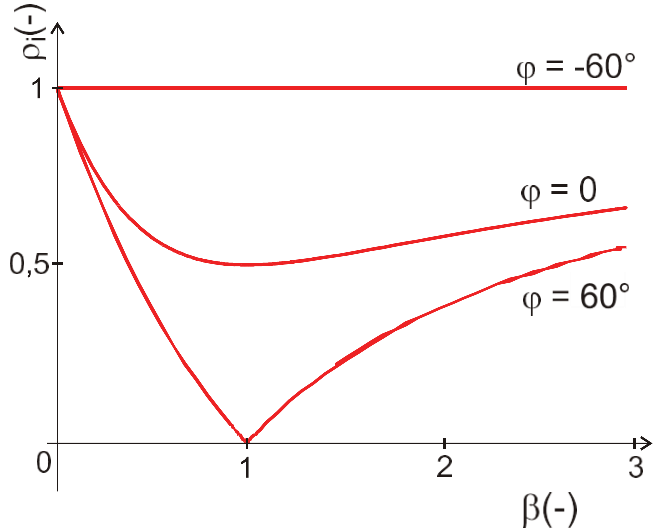

Fig. 1.12

Voltage imbalance can be calculated with equation (1.9), where S_1 and S_2 represent load powers of both windings of the supply station (transformers T_1 and T_2).

$$\rho_{\mathrm{U}} = \frac{S_1 + S_2}{S_1 + S_2 + S_{\mathrm{k}}} \tag{1.21}$$

The highest value of current must not cross a regulated threshold, for Imbalanced loading of a transformer decreases efficiency and over utilizes a transformer.

1.5. Sources

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4. Analysis and application of theories

This chapter of the thesis focuses on descriptive analysis of specific lexical elements. This analysis is conducted with the purpose of explication of translation theories, introduction, and description of extralinguistic properties of utterances, and clarifying specific actions that proved to be mandatory for finalisation of the translation. Figures and texts appearing in this chapter all originate in the translated text in Chapter 3, and therefore will not be cited. Citation will be omitted during the translation theory mention as well for no mention will exceed the content of Chapter 2.

4.1. Translation theory analysis

Viewing lexical elements through translation theories serves not only as clarification of cited theories but also as a confirmation of translation accuracy. This method of verification should be recommended only for the most difficult instances for it takes a considerable amount of time to recognize and classify all operations to their respective translation theories. Difficulty of this process can be attributed to the unconscious usage of these theories.

Protože PPPS specifikují všechny technické aspekty požadavků na rozhraní mezi PS a DS, nejsou již v Pravidlech provozování DS práva a povinnosti provozovatele PS podrobně uváděny.

=>

Rights and duties of PPS are not specified in detail in PPDS due to their specification in PPPS. Interface requirements between PS and DS are specified in PPPS as well.

This short paragraph is an explicit example of word-formation difference between the Czech and the English language. Versatility of word-formation rules in Slavic languages allows the Czech version of the sentence start with a conjunction, which is impossible with a stricter word-formation of a Germanic language. Usage of reordering translation procedure allowed for compliance with these strict rules. During the translation, the order of the clauses was switched as well. This is due to the diversity of emphasis placement in the two languages. The English language emphasizes the essential sentence elements, such as subject and predicate. The Czech language places this stress in a much more complex manner, frequently depending on the order the objects and adverbials. Splitting the sentence simplified the execution of these operations.

celkově efektivní provoz ES

=>

The overall effectiveness of ES operations

Reordering and basic case of word class substitution are the most commonly appearing operations required in translation between Czech and English languages. This fact corresponds with the differing origin of the languages, causing the significant divergence in word-formation of sentences.

Hloubka se vyjadřuje v procentech jmenovitého napětí.

=>

$\Delta U =< 100\% \wedge \Delta U > 0\%$

This translation of Czech language into a mathematical equation serves as an explicit case of inter-semiotic translation. Choosing this specific option allowed supplementation of the original message by adding the boundaries to a statement specifying units used for description of a phenomenon, improving the accuracy of the description.

Základ elektrizační soustavy – jakousi páteř – tvoří přenosová soustava.

=>

The core of ES is formed by PS.

This sentence clarifies the reduction translation procedure due to the versatility of the used terms. Further specification would prove redundant and reduce the readability of the transferred meaning.

spotřebič

=>

consumption

Substitution translation procedure was implemented on this word to describe the nature of consuming electricity, whilst avoiding the term appliance, which could be misleading due to its popularized usage towards everyday electrical devices, omitting industrial and other cases. Usage of this type of substitution requires knowledge of the mentioned topic and therefore lies under the semantic type of interlingual translation.

Některé části PPDS se vztahují jen na určité kategorie uživatelů DS, a to podle typu připojení nebo charakteru užívání DS. Všichni uživatelé však musí znát a respektovat ta ustanovení pravidel, která se jich týkají.

=>

All users are obliged to acquire knowledge of parts of PPDS, which cover their category of usage of DS. These categories vary by types of connection to the DS and the type of relation between the DS and the user.

This case of substantial reordering, covering multiple clauses elucidates the legal administrative literary style by contrasting with previous examples in multitude of text features. Texts of this nature prove to be very delicate and easy to misconstrue. Translation of this literary style requires extraordinary accuracy, for its legal purposes. This concept of complete accuracy often reduces the readability and comprehensibility of the text significantly. This fact must be taken into consideration since knowledge of most legal documents is required of people from diverse education levels.

Systémové elektrárny, vnořená výroba

=>

Transmission power plants, distribution power plants

These terms are unique to Czech language and are used very scarcely. This fact allowed for alteration of their specification. While the original descriptions are negligibly more accurate, the difficulty of these terms outpaces the rest of the document drastically. This disparity is widened by the absence of explanation of these terms.

First stage of the translation, decoding, required outside research. Second stage, coding, consisted of retaining the original message, distinction of power plants based on their ownership. Execution of the final stage, reproduction, required an intralingual translation of the original message to the type of connected network. These factors are directly interconnected, assuring the accuracy of the translation. Redesign of these terms during translation reverted the difficulty discrepancy, whilst allowing for complete understanding of the original message and retaining easy distinction between them.

4.2. Pragmatic aspect analysis [5]

Focusing solely on the linguistic aspects of the text would lead to misconstruction of the original message of the text. The difference between this failure and accurate translation lies in the extralinguistic aspects of the text. These aspects are indispensable in the coherence of the text. Understanding of pragmatic meaning is rooted in the knowledge of electrical engineering. This knowledge transforms a set of symbols without meaning into a unique utterance that is impossible to misapprehend. Interpretation of singular utterances in a short paragraph facilitates the explication of this concept.

> ***Transmission system (PS)-*** *interconnected set of 400kV, 220kV and selected 110kV lines and devices for transmission of electricity throughout ČR and maintaining connection to neighbouring PS, including measuring systems, protection systems, control systems, security systems, information systems and telecommunication technology.*

Transmission system– This term outlines the area or set of devices which define it. Linguistic aspects indicate multiple possible meanings, e.g., automobile transmission system which transmits energy from fuel combustion to the propulsion mediums (wheels). Pragmatic aspects explicate the improbability of this meaning. Decrease of the number of possible meanings results in increase of coherence of the text and improved readability of the text.

(PS)- Acronym does not match previous defining term. Linguistic means allow no possibility of connection, this would present this acronym as a mistake. Extralinguistic viewpoint allows the reader to see a reason behind this mismatch. This unification of labelling with other Czech study materials or schemes eliminates the need of additional research. Translating this process back into linguistic means discovers the resulting increase of provided information.

interconnected set- Linguistic means allow the reader to see that the transmission lines are connected in a way. Extralinguistic means specify this type of connection to integration of transformers, because any other type of connection of differing levels of voltages would mean irreversible loss of energy.

400kV– This feature of transmission lines presents multitude of indispensable information regarding the cable. With no extralinguistic properties, this utterance would simply describe amount of voltage flowing through the cable, not his ability to transmit this energy and ways of achieving this ability.

selected 110kV lines– Added meaning of this utterance signifies that the not selected portion of 110kV lines belongs to the distribution system.

devices– This utterance requires very basic understanding of electrical engineering for comprehending the exclusion of any (e.g., kitchen) appliances.

transmission of electricity– This utterance allows for comprehension of the added meaning through knowledge of a different field of science, specifically biology. Circulatory system shares many features with the explained utterance e.g., source (power plant = heart), and reduction of transmitted amount with proximity to the output for accurate distribution of transmitted substance. This similarity confirms the importance of general knowledge in the process of decoding the pragmatic meaning of an utterance, for using discretely electrical engineering provides significantly more complexion and offers very little simplification.

neighbouring PS– Signifies that ČR classifies foreign systems of electric energy transmission by their own classification. Furthermore, this statement allows for possibility of unified classification system with neighbouring countries.

Measuring systems– Exclusion of any measurement of values not participating in electrical engineering is a basic prerequisite to understanding the meaning of this term.

Protection systems– Linguistic properties of the term add meaning to the extralinguistic base, describing systems that protect from influence of electricity.

Control systems– Extralinguistic similarity to regulation systems allows for addition of linguistic meaning, the possibility of turning the regulated system on and off.

Security systems– Linguistic properties of the term specify the meaning of protecting the connected systems and property from outside influence.

Information system– Linguistic properties of the term specify the use of this type of system for transmission of data rather than energy.

Telecommunication technology– Subtype of information system used specifically for transmission and translation of data to sound or visual symbols for communication purposes. This relation to the Information system would be misconstrued without knowledge of electro-engineering.

5. Conclusion

The translated document is written in administrative and professional functional styles. The reader must possess knowledge of both functional styles to achieve accurate translation. Certain level of knowledge of electrical engineering is a prerequisite as well, because the extralinguistic aspects of the text would be incomprehensible to those not introduced to the field of expertise described in the text. Unfortunately, some of these prerequisites are outside the scope of the curriculum of my field of studies. This was the first of many complications I have encountered in the translation process. To acquire such knowledge in other ways than the university settings, I have consulted a British electro-engineering student, a Czech student of automation and an engine driver of České dráhy railway transport company. These consultations were executed in a friendly manner and proved to be a very effective method of acquiring information from direct sources based on their personal experience in the individual disciplines. I have used this information in my best conscience to create both accurate and readable translation of the original text.

During the translation process, some translation theories have been executed more frequently than others. Over-usage and underutilization of several theories is caused by the origin diversity of original and target languages. The Czech language falls under the category of West Slavic languages. The English language is categorized as a West Germanic language. This difference can be easily described on the level of word-formation variability which significantly raised the number of instances where reordering translation procedure became necessary. While the Czech language allows for multiple versions of sentences, the English language often offers no possible alterations. Following this stricter word-formation of English knowledge resulted in reduction of readability. This problem was avoided by substitution translation procedure. On the other hand, the lack of artistic aspects in the text ensued absence of the whole stylistic translation type. List of translation theories contains completely unused or very scarcely implemented operations. These operations are listed for the wholeness of the theoretical part of the thesis. This fact enables the use of the knowledge gained by reading this document without further research.

One of the most difficult complications I have faced during the translation is the occurrence of Czech acronyms, some referring to the information that can be translated, and some which cannot be. Split decision between attempting to semantically translate all acronyms and retaining the Czech acronyms with direct description in English language has been decided by acknowledging the purpose of the translation. The translated text will serve as study material to foreign students in the Czech Republic, therefore avoiding acronyms of Czech institutions and electro-engineering descriptions would prove contra-productive to their attempt of understanding Czech culture.

Additional complications have been caused by the PDF format. This format is known to cause issues while being converted to docx, especially in texts containing equations and figures. Difficulty of figure translation was circumvented by cropping, and photoshopping the original pictures instead of traditional use of PDF to word converter. Solving the problem with equations was postponed until I have been provided with the original docx version of the document. Other possible methods would take considerable time, requiring full transcription. Further improvement of the translation would require an independent subject to read the text, highlight inaccuracies, mistakes, and later corrections.

6.Rozšířený český abstrakt

Tato práce popisuje proces překladu úvodní kapitoly elektrotechnické učebnice Provoz distribučních soustav z univerzity České vysoké učení Technické v Praze. Tento překlad bude použit budoucími zahraničními studenty ERASMU, kteří přijedou do Prahy studovat elektrotechniku.

Tato práce se skládá z pěti základních kapitol. Úvod seznámí čtenáře se základními informacemi, které jsou potřebné k pochopení následujících kapitol. Příkladem těchto informací je rozlišení funkčních stylů, které se v textu vyskytují a jak je s touto informací během překladu naloženo. Také jsou zde krátce popsány funkce následujících kapitol společně s odůvodněním jejich řazení.

Druhá kapitola popisuje překladové teorie. Popsané teorie byly vybrány z důvodů častého výskytu v přeloženém textu ve třetí kapitole, nebo jejich srozumitelnosti a relevance pro popis ve čtvrté kapitole.

Překladové procedury jsou popsány z dvou hlavních pohledů, prvního od autorů Vinay a Darbelnet, sepsaného v roce 1958 a doplněného v roce 1995. Pozdější rozdělení od Josepha L. Malone bylo sepsáno v roce 1988. Rozdíl mezi těmito pohledy je nejlépe zpozorovatelný z pohledu obtížnosti, konkrétnosti a docílené všestrannosti.

Dále jsou vysvětleny principy překladu, vnitro-jazyčný, mezi-znakový a mezi-jazyčný. Tato klasifikace byla navržena Romanem Jakobsonem v roce 1971. Vnitro-jazyčný překlad je používám pro úpravu čitelnosti, obtížnosti, nebo stylistických vlastností textu. Mezi-znakový překlad využívá rozdílu znakových systémů, například jazyk nebo matematická rovnice, za účelem úpravy podoby textu bez změny významu. Poslední princip překladu, mezi-jazyčný, je nejtypičtějším příkladem překladu. Tento princip je použit za účelem porozumění textu sepsaného autorem, který používá jiný jazyk než čtenář.

Následný popis rozdělení typů překladů na komunikativní a sémantický slouží k oddělení jednoduchosti překladu používaného v běžných konverzacích a opatrnosti překladu textu s možnými trvalými následky. Tato kategorizace byla navržena Peterem Newmarkem roku 1981. Také jsou zde popsány podtypy komunikativního překladu, překlad „slovo-od-slova“, který nedbá na žádná gramatická pravidla jazyka. Tento podtyp je nabízen často používanou službou Google-překladač. Druhým podtypem je stylistický překlad, který upřednostňuje stylistické vlastnosti textu nad gramatickými pravidly. Tento podtyp se používá nejčastěji u překladu textu písní a básní.

Rozdělení fází překladu slouží k nahlédnutí do procesu z pohledu snahy o zachování podstaty originálního textu. Tento proces se skládá ze tří fází. Fáze porozumění, ve které je text přečten a pochopen. Fáze interpretace, ve které překladatel přetvoří text do formy jeho významu. Poslední fáze, reprodukce, kde je význam textu zasazen do pravidel jazyka, ve kterém je překlad žádán.

Následující rozdělení chyb v procesu překladu slouží k pochopení rozdílu mezi nepřesností překladu a porušení pravidel gramatiky. Toto rozdělení chyb je používáno v systému známkování didaktických testů českého jazyka.

Třetí kapitola obsahuje samotný přeložený text, ve kterém autor popisuje, vysvětluje a znázorňuje provoz a operace distribučních soustav a jejich přilehlých systémů.

Mnou zvolená kapitola se skládá z několika částí. Úvodní tabulka s původním využitím, ulehčení popisu procesů v distribučních soustavách, díky překladu získala navíc funkci rychlého a přehledného seznamu českého značení pro zahraniční studenty.

Dále jsou v kapitole vypsány základní informace s jejich jasnými definicemi. Představeny jsou také profese a funkce, které jsou s operacemi popsaných systémů spojeny. Tyto definice nabírají nejen technického, ale i legislativního charakteru, jelikož popisují způsoby řešení situací, se kterými se pracovník v oboru energetiky a elektrotechniky může setkat. Po ujasnění vypsaných záležitostí text následuje typický postup objasnění komplexních systémů. Nejprve popisuje rozsáhlé, celostátní, procesy a postupně se přes rozdělení a kategorizaci těchto systémů zaměřuje na detailnější procesy, zařízení, jednotky, fakta a jejich popisy či způsoby vyčíslení. Díky tomuto přístupu je kapitola na svůj rozsah velice detailní, ale zároveň soběstačná.

Obohacení této kapitoly o přílohy v podobě grafů a schémat zjednodušilo proces vysvětlování vztahů mezi jednotlivými skutečnostmi a umožnilo směřování pozornosti k ujasnění jednotlivých případů a možností, které se k systémům vztahují.

Čtvrtá kapitola obsahuje analýzu z pohledu popsaných překladových teorií na konkrétních případech vyskytujících se v přeloženém textu. Nejdetailněji je analyzován rozdíl slovosledu v použitých jazycích za účelem popisu rozdílu v původu těchto jazyků. Tento rozdíl je vysvětlen na krátké definici, která vysvětluje, proč se práva a povinnosti provozovatelů distribučních soustav nacházejí v dokumentu o soustavách přenosových, nikoliv distribučních. Komplexnost tohoto faktu zvýrazňuje důležitost přesnosti jeho popisu. Poté jsou analyzovány některé často používané procedury, netypické způsoby překladu a popis komplexnosti překladu části textu, která popisuje zákonodárná tvrzení.

Druhá část analýzy podrobně rozebírá pragmatický význam odborné definice přenosové soustavy. V této části je také podrobně vysvětlen rozdíl mezi lingvistickým a pragmatickým významem a nutnost znalosti odborné informace k pochopení pragmatických aspektů, které se v jednotce vyskytují. Poté následuje popis pragmatického významu jednotlivých lexikálních jednotek v této definici s popisem jeho rozdílu od lingvistického pojetí významu.

Poslední kapitola provází čtenáře zkušenostmi, které překladatel získal během procesu překladu. Pojednává o nutnosti znalosti elektrotechniky k pochopení skutečného významu textu. Některé z těchto znalostí však přesahují osnovy studijního plánu autorova oboru, což byla první z mnoha komplikací, které se vyskytly během překládání textu. K získání těchto vědomostí autor použil své konexe a konzultoval s osobami, které v oboru studují, či pracují. Tyto konzultace proběhly v přátelském stylu. Díky výběru konzultantů s přímými zkušenostmi v oboru byly informace jednoduše zpracovatelné a zasazení do konkrétních případů zjednodušilo proces zakomponování znalostí do textu.

Frekvence použití jednotlivých překladových teorií je zapříčiněna rozdílem původu použitých jazyků. Tento rozdíl je nejjasněji pozorovatelný na volnosti slovosledu ve větách těchto jazyků. Zatímco český jazyk často umožnuje prohození a přeskládání slovosledu, anglický jazyk je v tomto ohledu velice striktní. Snažení o neporušení těchto striktních pravidel snížilo čitelnost textu. Tento posun byl zvrácen použitím substituční procedury. Na druhé straně frekvenčního spektra leží stylistický překlad, který nebyl během překladu použit díky absenci důrazu na stylistické kvality textu v použitých funkčních stylech. Druhá kapitola popisuje i tyto nepoužité operace za účelem celistvosti popisu překladových teorií. Díky této celistvosti je možné okamžité využití znalostí z tohoto dokumentu.

Dále jsou v kapitole popsány rozhodnutí, kterým autor během překladu čelil. Následně jsou popsány řešení technických potíží, které se týkaly překladu tohoto konkrétního textu.

V poslední části této kapitoly je popsán návrh budoucího postupu za účelem zjednodušení a dosažení přesnějšího a funkčnějšího překladu kapitoly a následné kompletace a zasazení do kompletního dokumentu použitelného v univerzitním prostředí.

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